

**U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF CHEMISTRY-BULLETIN
NO. 66 (REVISED). FRUITS AND FRUIT
PRODUCTS: CHEMICAL AND
MICROSCOPICAL EXAMINATION**

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W. D. BIGELOW

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H. W. WILEY, Chief of Bureau.

53

FRUITS AND FRUIT PRODUCTS:

CHEMICAL AND MICROSCOPICAL
EXAMINATION.

PREPARED UNDER THE DIRECTION OF

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CHIEF OF FOOD LABORATORY,

BY

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WASHINGTON:
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1905.

LETTER OF TRANSMITTAL

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF CHEMISTRY,
Washington, D. C., March 29, 1905.

SIR: I have the honor to transmit herewith a report on an investigation of fruit and fruit products, published in 1902 as Bulletin No. 66 of the Bureau of Chemistry, with the request that it be reprinted in revised form, certain minor corrections having been made in the tabulated data and references.

Respectfully,

H. W. WILEY,
Chief of Bureau.

HON. JAMES WILSON,
Secretary of Agriculture.

INTRODUCTION.

Questions affecting the purity of staple foods are of vital interest to practically our whole population. This interest is increased, from the moral and commercial standpoints, with foods produced and manufactured in this country.

During recent years the cultivation of fruit and the manufacture of fruit products have reached such proportions that information is often sought regarding the true character of the preparations on the market.

The adulterants mentioned in the following pages are to be criticised on the ground of deception rather than because of their being prejudicial to health. At the same time, salicylic acid and saccharin are regarded with disfavor by the majority of disinterested investigators, it is conceded that benzoic acid should be subjected to further study before its use be unrestricted, and it sometimes happens that colors are employed that are not altogether lacking in injurious properties. There is a demand for further study of the effects of preservatives in general on the health of the consumer.

As stated above, however, the great majority of samples reported in the following pages as adulterated are probably not injurious articles, and their sale under proper labels is not open to objection. Correct labeling, however, is essential to the welfare of reliable manufacturers as well as that of consumers.

Many large manufacturers find it advantageous to add a commercial preservative to hold fruit in a partially prepared condition and finish it up at their convenience; to add apple juice, not as a "make weight" alone, but to insure a good, firm jelly; and to employ artificial colors to compensate for dilution with apple juice and to prevent fading on the grocers' shelves.

When such practices as the above are not indicated on the label, jellies made of a given fruit and sugar alone are subjected to unfair competition. The two articles may be equally wholesome, but there are many who prefer the latter and are willing to pay for the increased cost of manufacture.

There are numerous small establishments engaged in the preparation of "home-made" jellies and jams that are really true to name, and the number of private families that add something to their income in the same way is very great. Their welfare requires correct labeling of imitation products.

Moreover, the consumer has a right to expect that food products shall be true to label in every respect. There should be no misrepresentation regarding quality of product, variety of fruit employed,

place of production, or name of manufacturer. It is a common practice, for instance, to label all pears as Bartletts. This works injustice to both producers and consumers. Many canners place their own labels only on their best brands and pack inferior goods under the names of fictitious firms. This practice is less objectionable when the goods can be readily traced to the manufacturer, but it often happens that letters addressed to such fictitious firms are returned to the sender. The practice becomes most reprehensible when such inferior articles are marked "first quality."

Another form of mislabeling often resorted to is the branding of fruits of one locality with the name of a State or district which has attained an enviable reputation for the production of certain fruit. In this connection may be noted an injunction recently obtained in the Baltimore courts restraining certain packers from labeling their wares as California products.

For the purpose of comparison numerous analyses of fruits have been compiled, and fresh fruits, and jellies and jams prepared in the laboratory, have been examined.

The samples of fruit products examined were taken at random, no attempt being made to secure either high or low grade goods. On the contrary, attempts were made to secure a set of samples that would be thoroughly representative of the fruit products on the market. This matter is attended with great difficulty. The various manufacturers do not send their high-grade goods to the same markets. It often happens that a given firm which makes several brands of goods only finds sale for its lowest grade in some cities, where some manufacturers place only their best goods. The same conditions apply to different stores in the same city. It is quite possible that we have secured samples of high-grade goods of some manufacturers and overlooked stores which handled their cheap products, or vice versa.

As stated above, however, the samples were collected in such a manner as to preclude these conditions as far as possible. The cities of Washington, New York, Philadelphia, and New Orleans were visited by representatives of the Bureau and a list of stores selected where it was thought all grades of goods could be found. Samples were secured of all jellies, jams, and similar preparations on sale at these stores. A few additional samples were received from other sources.

All of the work in connection with this bulletin was accomplished by those whose names appear on the title-page, except the nitrogen determinations, which were made by Mr. T. C. Trescott.

As indicated above, the primary purpose of the work was to determine the character of the fruit products on the market. At the same time, the analyses given are of scientific value in extending our knowledge of the composition of fruits.

W. D. BIGELOW,
Chief of Food Laboratory

CONTENTS.

	Page.
Chemical examination of fruits and fruit products	9
Methods of analysis	9
General discussion	9
Preliminary examination	9
Preparation of samples	10
Fresh fruits	10
Juices and jellies	10
Jams, marmalades, preserves, and canned fruits	11
Determination of total solids	11
In juices and jellies	12
By direct determination	12
By calculation from specific gravity	12
In fresh fruits, jams, marmalades, preserves, and canned fruits	12
Determination of insoluble solids	13
Kremla's method	13
German official method	13
Determination of ash	13
Examination of ash	14
Alkalinity	14
Sulphates and chlorids	14
Determination of total acids	14
Determination of volatile acids	15
Determination of free mineral acids	15
Determination of tartaric, citric, and malic acids	16
Determination of tartaric acid	16
Determination of citric acid	17
Determination of nitrogen	17
Determination of alcohol	17
Polarization	18
Determination of cane sugar	18
By calculation from Clerget's formula	18
By copper reduction	19
Determination of reducing sugars	19
Determination of dextrin	20
Determination of alcohol precipitate	21
Determination of tannin and coloring matter	22
Detection of preservatives	22
Salicylic acid	22
Benzoic acid	23
Saccharin	23
Detection of foreign coloring matter	23
Detection of coal-tar colors by dyeing wool	24
Method of Soetegni and Carpentieri	24
Arata's method	24

Chemical examination of fruits and fruit products—Continued.

	Page.
Methods of analysis—Continued.	
Detection of foreign coloring matter—Continued.	
Detection of coal-tar colors by extraction with solvents	26
Detection of acid magenta	28
Detection of cochineal	28
Detection of caramel	28
Detection of gelatin	29
Detection of agar-agar	29
Detection of starch	30
Determination of heavy metals	30
Added substances	31
Glucose	31
Preservatives	34
Starch	35
Coloring matter	36
Gelatinizing agents	37
Artificial sweetening materials	38
Foreign fruits	38
Heavy metals	39
Analytical data	41
Fresh fruits and fruit juices	41
Solids	47
Ash	47
Acidity	47
Protein	47
Sugars	48
Polarization	48
Alcohol precipitate	49
Jams and jellies prepared in the laboratory	50
Commercial fruit products	53
Jams	53
Discussion	53
Jams containing no glucose	59
Jams containing glucose, but not so labeled	63
Compound jams	70
Jellies	73
Jellies containing no glucose	73
Jellies containing glucose, but not so labeled	78
Compound jellies	81
Canned fruits	84
Brandied fruits	96
Fruit butters	96
Solid marmalades	98
Correspondence with manufacturers	98
Microscopical examination of fruits and fruit products	105

ILLUSTRATIONS.

	Page.
PLATE I.—Fig. 1. Fruit-pulp cells—apple	110
2. Fruit-pulp cells—pear	110
II.—Fig. 1. Fruit-pulp cells—quince	110
2. Fruit-pulp cells—plum	110
III.—Fig. 1. Fruit-pulp cells—peach	110
2. Fruit-pulp cells—apricot	110
IV.—Fig. 1. Fruit-pulp cells—grape	110
2. Fruit-pulp cells—strawberry	110
V.—Fig. 1. Fruit-pulp cells—red raspberry	110
2. Fruit-pulp cells—black raspberry	110
VI.—Fig. 1. Fruit fibro-vascular bundles	110
2. Fibro-vascular bundles of apple	110
VII.—Fig. 1. Fibro-vascular bundles of pear	110
2. Fibro-vascular bundles of quince	110
VIII.—Fig. 1. Fibro-vascular bundles of plum	110
2. Fibro-vascular bundles of peach	110
IX.—Fig. 1. Fibro-vascular bundles of apricot	110
2. Fibro-vascular bundles of grape	110
X.—Fig. 1. Elements of fibro-vascular bundles of apple	110
2. Elements of fibro-vascular bundles of pear	110
XI.—Fig. 1. Elements of fibro-vascular bundles of quince	110
2. Elements of fibro-vascular bundles of plum	110
3. Elements of fibro-vascular bundles of grape	110
XII.—Fig. 1. Elements of fibro-vascular bundles of peach	110
2. Elements of fibro-vascular bundles of apricot	110